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(54) Data processing systems for generating printed materials

(57) A method and apparatus of generating printed copies of internet pages from the worldwide web, utilising a data processing system, a plurality of internet page record locators, and a printer, in accordance with operator-selected formatting, characterised by the data processing implemented steps of:

(a) receiving operator input for selection for printing of particular internet pages which are associated with corresponding particular ones of said plurality of internet page record locators;

(b) retrieving said particular internet pages utilizing said corresponding particular ones of said plurality of internet page record locators;

(c) receiving operator input for operator selected format requirements;

(d) utilising said printer for printing said particular internet pages in accordance with said operator selected format requirements.

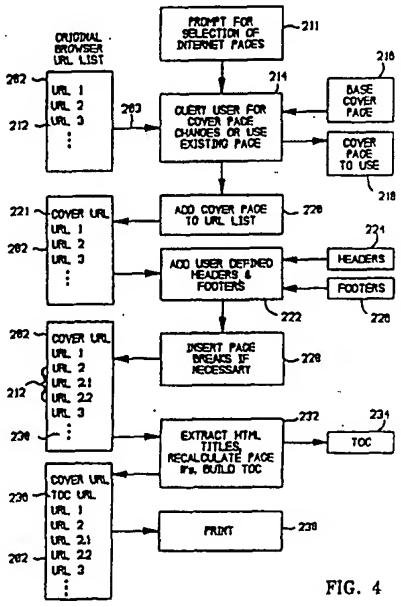

FIG. 4

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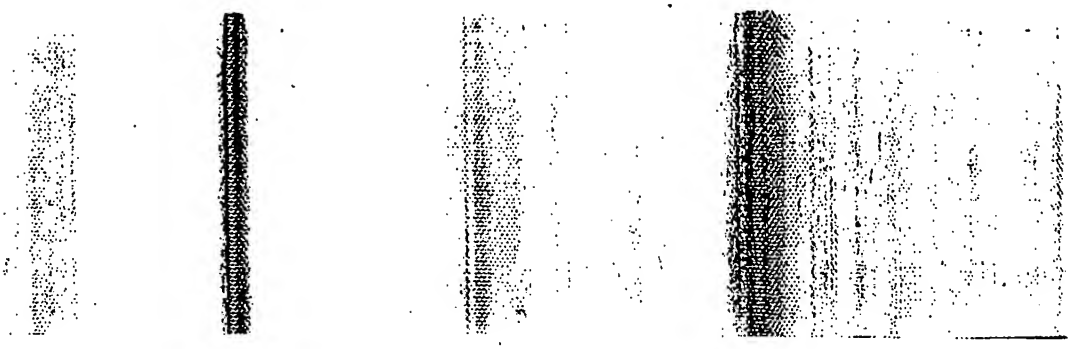

of the data processing implemented steps of formatting worldwide web pages in accordance with the present invention;

Figure 5 is a pictorial representation of an exemplary worldwide web page;

Figures 6 through 6E are pictorial representations of the exemplary types of some formatting operations which can be performed utilising the present invention; and

Figures 7A through 7C are flowchart representations of several formatting routines.

The method and apparatus of the present invention may be utilised in a distributed data processing system and/or in a personal computer. The distributed data processing system will be described with reference to Figure 1, and the personal computer will be described with reference to Figure 2.

As is shown in Figure 1, distributed data processing system 8 may include a plurality of networks, such as local area networks (LAN) 10 and 32, each of which preferably includes a plurality of individual computers 12, 30, respectively. Of course, those skilled in the art will appreciate that a plurality of intelligent work stations coupled to a host computer may be utilised for each such network. As is common in such distributed data processing systems, each individual computer may be coupled to a storage device 14 and/or a printer/ output device 16, One or more such storage devices 14 may be utilised, in accordance with the method and system of the present invention, to store various "groupware" applications or documents which may be simultaneously or successively accessed and processed by multiple users. Furthermore, one or more systems may be included for managing data processing resources, including the groupware applications and documents, in accordance with conventional technologies.

Still referring to Figure 1, it may be seen that distributed data processing network 8 may also include multiple mainframe computers, such as mainframe computer 18, which may be preferably coupled to local area network (LAN) 10 by means of communication link 22. Mainframe computer 18 may be coupled to a storage device 20 which may serve as remote storage for local area network (LAN) 10 and may be coupled via communications controller 26 and communications link 34 to a gateway server 28. Gateway server 28 is preferably an individual computer or intelligent work station (IWS) which serves to link local area network (LAN) 32 to local area network (LAN) 10.

As discussed above with respect to local area network (LAN) 32 and local area network (LAN) 10, a plurality of data objects, application programs, and data files, groupware programs, or groupware documents may be stored within storage device 20 and controlled by mainframe computer 18, as resource manager or library service for the data objects and documents thus stored. Those skilled in the art will appreciate that it is often desirable to permit simultaneous or successive, as well as restricted, access to such data objects, application programs, data files, groupware applications, or groupware documents to allow for the beneficial synergistic effects of group work. The distributed data processing system can be communicatively coupled to the worldwide web 40. Additionally, those skilled in the art will appreciate that mainframe computer 18 may be located a great geographical distance from local area network (LAN) 10; and, similarly, local area network (LAN) 10 may be located a substantial distance from local area network (LAN) 32. That is, local area network (LAN) may be located in California, while local area network (LAN) 10 may be located in Texas, and mainframe computer 18 may be located in New York.

With reference now to the figures and in particular with reference to Figure 2, there is depicted a pictorial representation of data processing system 110 which may be programmed in accordance with the present invention. As may be seen, data processing system 110 includes processor 112 which preferably includes a graphics processor, memory device and central processor (not shown). Coupled to processor 112 is video display 114 which may be implemented utilising either a colour or monochromatic monitor, in a manner well known in the art. Also coupled to processor 112 is keyboard 116. Keyboard 116 preferably comprises a standard computer keyboard which is coupled to the processor by means of cable 118.

Also coupled to processor 112 is a graphical pointing device, such as mouse 120. Mouse 120 is coupled to processor 112, in a manner well known in the art, via cable 122. As is shown, mouse 120 may include left button 124, and right button 126, each of which may be depressed, or "clicked", to provide command and control signals to data processing system 110. While the disclosed embodiment of the present invention utilises a mouse, those skilled in the art will appreciate that any graphical pointing device such as a light pen or touch sensitive screen may be utilised to implement the method and apparatus of the present invention.

Upon reference to the foregoing, those skilled in the art will appreciate that data processing system 110 may be implemented utilising a so-called personal computer, such as those manufactured by International Business Machines Corporation.

Figure 3 is a block diagram and pictorial representation of the method and apparatus of the present invention for generating hard copy printouts of worldwide web pages, shown in broad overview. Graphical user interface directory file 202 is provided as a component of a graphical user interface in the data processing system 110 of Figure 2. It includes a plurality of internet page record locators 212. In accordance with one particular embodiment of the present invention, the internet page

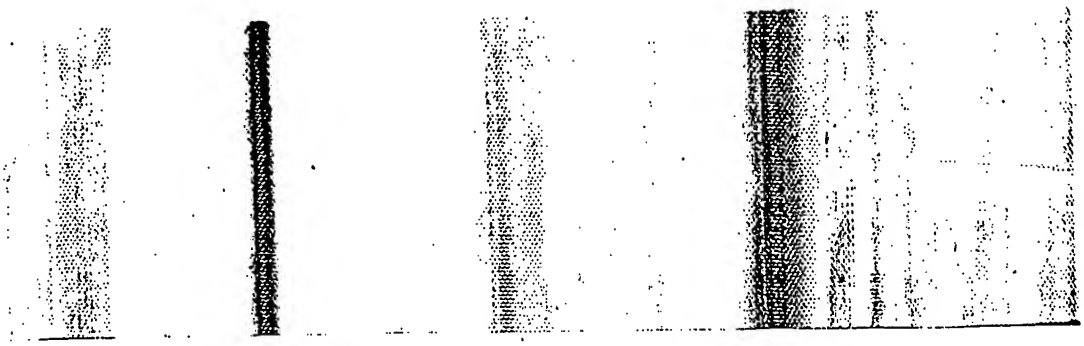

Figure 5 is a pictorial representation of an exemplary Internet page 238. As is shown, a page title 240 is provided in the upper lefthand portion of Internet page 238. Pagination information 242 is provided in the upper righthand portion of Internet page 238. A graphical component 244 is provided which identifies the company associated with the Internet page 238. A text and graphical component 246 is provided which identifies the content of the Internet page 238. A plurality of subordinate graphical and text components 248 are provided in Internet page 238. Some relatively standard text 250 is provided within Internet page 238, as well as text 254 which includes some graphical components (such as the heart shape in the word "Love").

At the bottom of Internet page 238, a variety of textual and graphical components are provided which constitute a visually perceptible Internet link from Internet page 238 to other related Internet pages. A variety of icons 258, 260, 262, 264, are provided. A variety of text links 266, 268, 270, 272, 274, 276, 277, are also provided. Internet specific textual information 278 is provided within Internet page 238. Standard legal disclaimers 280 are provided in Internet page 238. The items at the lower portion of Internet page 238 constitute Internet page specific information 256 which need not be present on Internet page 238 when it is in the form of printed material. In fact, such textual and iconographic components may be confusing and serve no purpose in printed text material. The operator may desire that this information be removed or modified in order to make the printed materials look professional.

In some instances, an Internet page will include either or both of textual or graphical components which are introduced into the page by the Internet browser software. In the exemplary page of Figure 5, the page title 240 and the pagination information 242 are provided in Internet page 238 by the browser software. In the preferred embodiment of the present invention, the operator should be provided with an option or election regarding browser-specific text or graphics. The operator is allowed to either "turn off" the browser-specific items or leave them in the printed page.

Figures 6A, 6B, 6C, 6D, and 6E are pictorial representations of some of the exemplary types of formatting operations and formatting requirements which may be determined by the operator, in accordance with the present invention. Figure 6A depicts the generation of a cover page. As is shown, cover page 292 may be generated which is affiliated or associated with Internet pages 294, 296, 298, and 300. A table of contents 301 may also be generated which is associated with the Internet pages. As is depicted in Figure 6B, Internet pages may be printed with user-defined headers and footers. As is shown, Internet page 203 will include user-defined header 304 and user-defined footer 306. Internet page 308 will include user-defined header 310 and user-defined footer 312. Internet page 314 will include user-defined header 316 and user-defined footer 318. Internet page 320 will include user-defined header 322 and user-defined footer 324. Figure 6C graphically depicts the operator determination of content allocation among pages. As is shown, Internet page 338 includes content 339 which may be separated into portions 340, 342, with each portion provided on a separate Internet page 342, 346. In this manner, the operator may determine how the text and images are grouped and located on the printed pages. This will prevent the separation of text from image and a pagination which interrupts or breaks images into multiple components. Figure 6D is a pictorial representation of the pagination operations. As is shown, Internet page 256 is provided with pagination information 258. Internet page 260 is provided with pagination information 262.

Internet page 264 is provided with pagination information 266. Figure 6E is a pictorial representation of organisation of the printed material in accordance with the present invention. As is shown, cover page 270 and table of contents 272 are provided and associated with Internet pages 274, 276, 278. These printed materials may be utilised by the operator as informational, promotional, or sales material. One principal advantage of the present invention is that a group of sales or marketing personnel may be able to conduct business without carrying large quantities of printed materials about with them. The mobile personnel may utilise a portable computer and a printer to generate the particular informational, sales, or promotional materials at the customer's site or at a particular location before making sales, service, or other calls within a region. This allows an enormous amount of printed material to be available to the mobile personnel, in allowing the quick, trouble-free, and low-cost generation of printed materials in the field.

Figure 7A, 7B, and 7C depict in flowchart form some of the basic operations performed utilising the present invention. Figure 7A is a flowchart representation of the generation of a cover page. Figure 7B is a flowchart representation of the generation of headers and footers. Figure 7C is a flowchart representation of the determination of page breaks. Referring first to Figure 7A, the process begins at software block 400 and continues at software block 402, wherein data processing system 110 prompts the user to determine whether there is an existing cover page associated with a particular set of Internet pages desired for printing; if not, control passes to software block 406; if so, control passes to software block 404. In accordance with software block 404, data processing system 110 determines whether the user will modify the existing cover sheet. If the existing cover sheet will not be modified, control passes to software block 408, where the process ends; if it is determined in software block 404 that the existing cover sheet will be modified, control passes to software block 410, wherein the data processing system 110 determines whether a form will be utilised for the modifications. If a form is utilised, control passes to software block 412, wherein the options are shown to the opera-

enhance the functionality of the browser software and make it more marketable.

Claims

1. A method of generating printed copies of internet pages from the worldwide web, utilising a data processing system, a plurality of internet page record locators, and a printer, in accordance with operator-selected formatting, characterised by the data processing implemented steps of:

   (a) receiving operator input for selection for printing of particular internet pages which are associated with corresponding particular ones of said plurality of internet page record locators;

   (b) retrieving said particular internet pages utilising said corresponding particular ones of said plurality of internet page record locators;

   (c) receiving operator input for operator selected format requirements;

   (d) utilising said printer for printing said particular internet pages in accordance with said operator selected format requirements.

2. An apparatus for generating printed copies of internet pages from the worldwide web, comprising:

   a data processing system and associated printer;

   a computer program executable by said data processing system, which characterised by the following program components:

   (a) data processing instructions for allowing operator selection and recording of a plurality of internet page record locators;

   (b) data processing instructions for receiving operator input for selection for printing of particular internet pages which are associated with corresponding particular ones of said plurality of internet page record locators;

   (c) data processing instructions for retrieving said particular internet pages utilising corresponding particular ones of said plurality of internet page record locators;

   (d) data processing instructions for receiving operator input for operator selected format requirements; and

   (e) data processing instructions for printing said particular internet pages in accordance with said operator selected format requirements.

3. A method or apparatus as claimed in Claim 1 or 2 respectively:
   wherein said plurality of internet page record locators comprise internet universal record locators.

4. A method or apparatus as claimed in Claim 1 or 2 respectively wherein said step of retrieving or said computer program comprises either retrieving or data processing instructions for retrieving said particular internet pages from at least one of (a) said data processing system, and (b) said worldwide web utilising corresponding particular ones of said internet page record locators.

5. A method or apparatus of generating printed copies in accordance with Claim 1 or 2 respectively:
   wherein said operator selected format requirements include at least one of:

   (1) operator defined headers;

   (2) operator defined footers;

   (3) operator determined page breaks;

   (4) operator determined pagination information;

   (5) operator defined cover sheets;

   (6) operator defined table of contents;

   (7) operator determined content allocation among pages; and

   (8) operator determined content from said internet pages.

6. A method or apparatus of generating printed copies in accordance with Claim 1 or 2 respectively, further comprising the step or means respectively of including said plurality of internet page record locators in a graphical user interface directory file in said data processing system.

7. A method or apparatus of generating printed copies in accordance with Claim 1 or 2 respectively, further comprising either the step of or said computer program including means for automatically removing internet identification titles from said particular internet pages.

8. A method or apparatus of generating printed copies

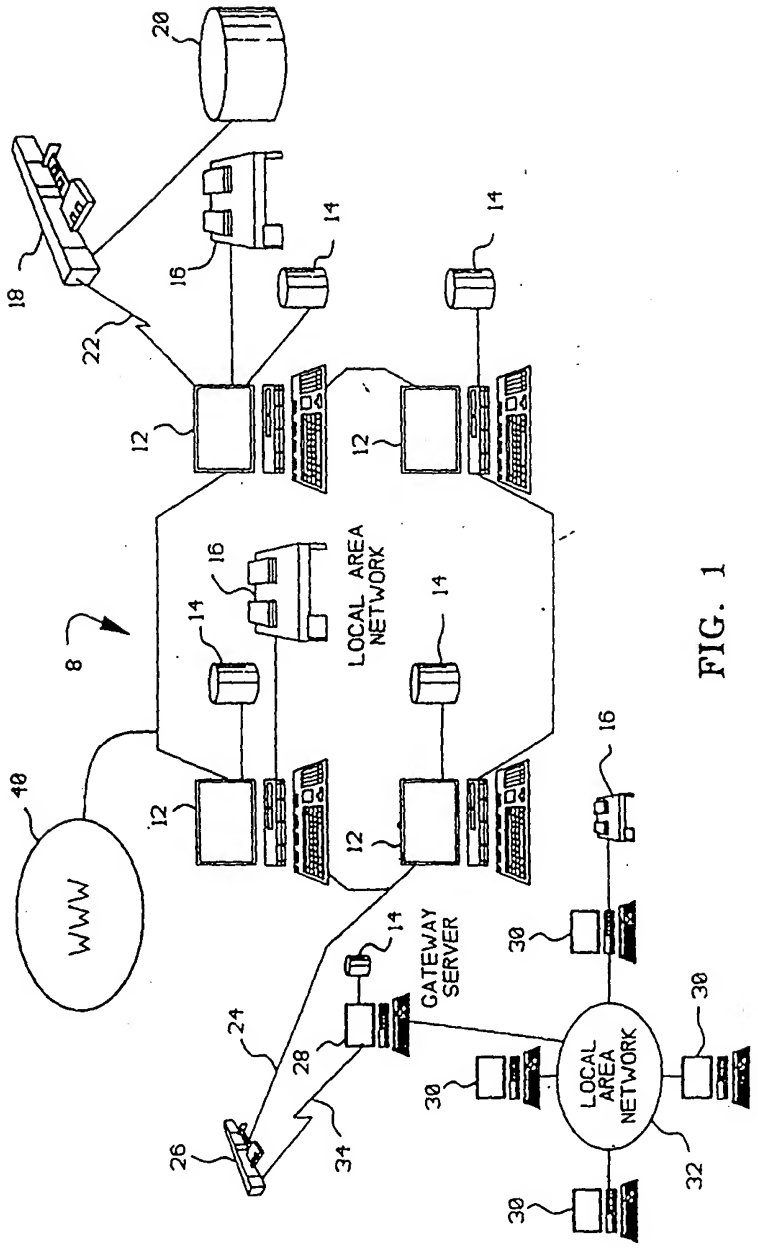
20
18
16
14
14
22
12
12
LOCAL AREA NETWORK
16
14
14
8
40
12
12
16
WWW
14
GATEWAY SERVER
30
24
28
30
LOCAL AREA NETWORK
30
26
34
32
30

FIG. 1

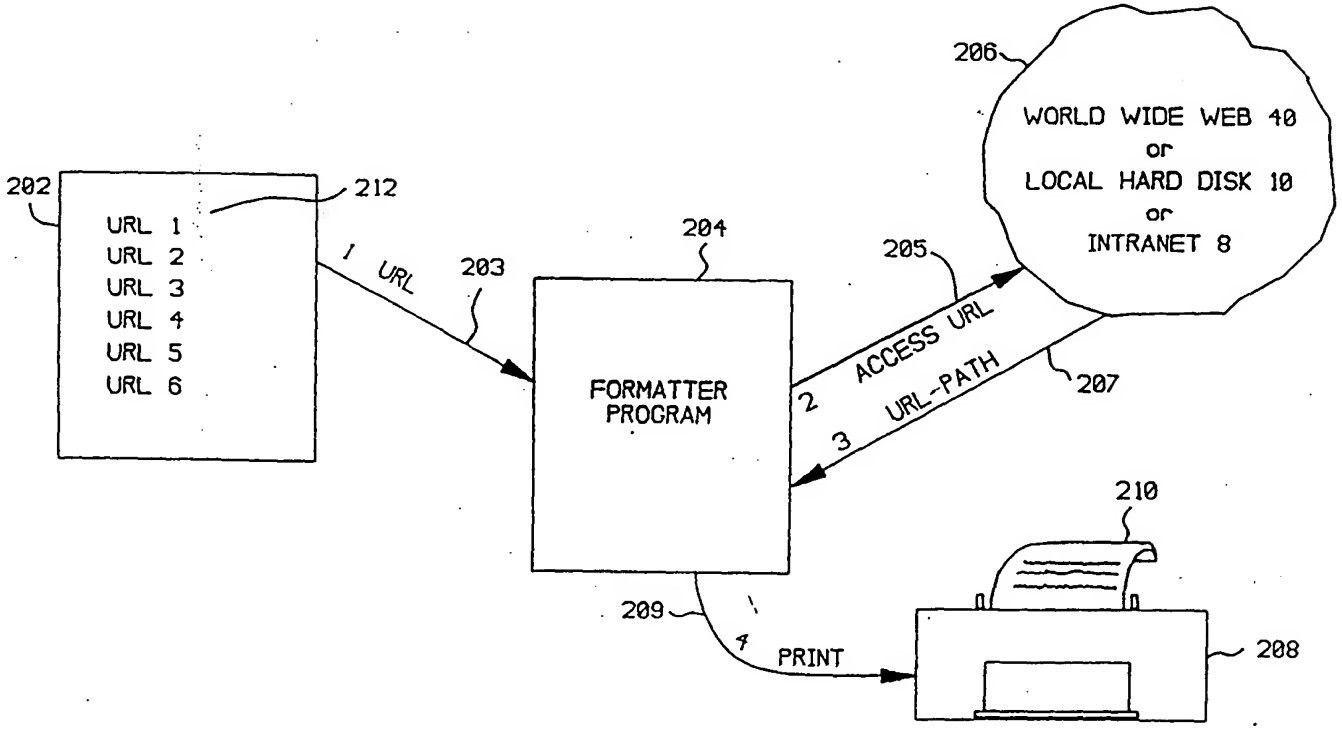

FIG. 3

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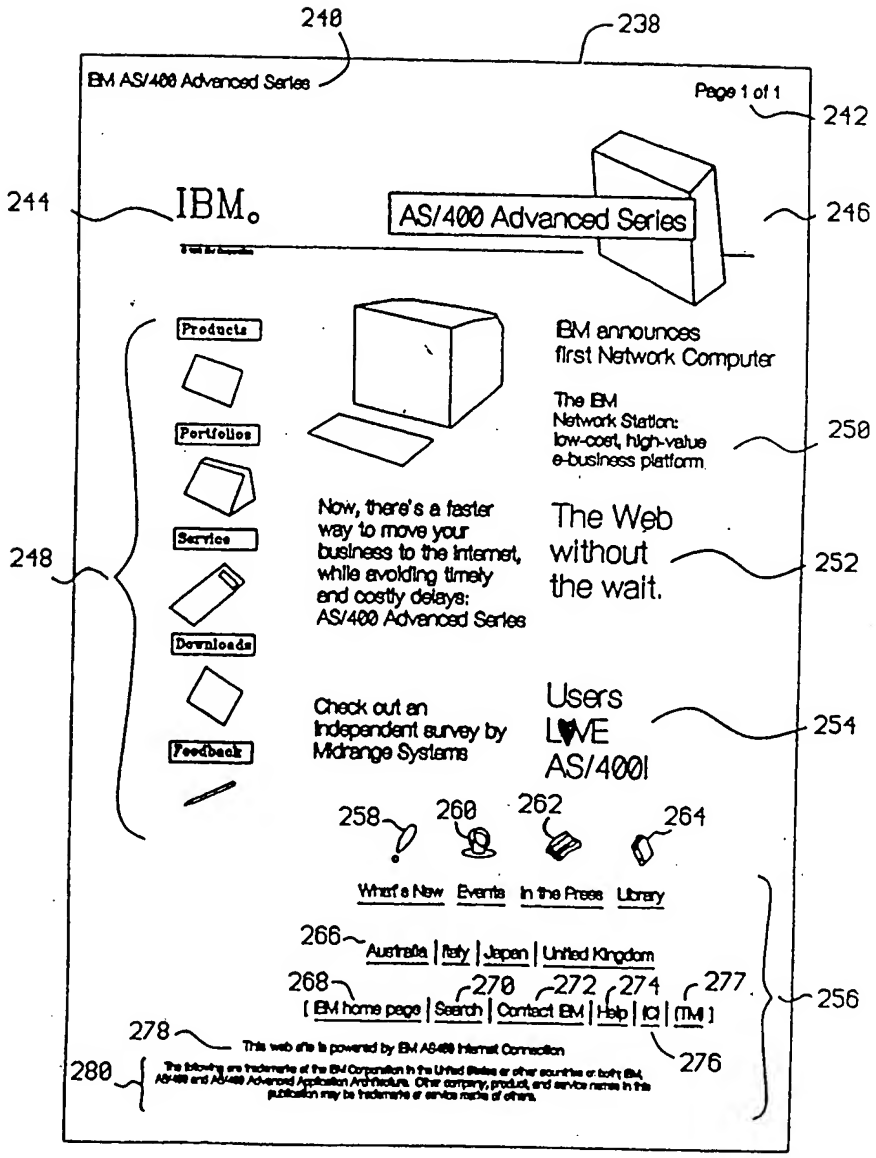
240
238
IBM AS/400 Advanced Series
Page 1 of 1
242
244
IBM
AS/400 Advanced Series
246
Products
Portfolios
Service
Downloads
Feedback
248
IBM announces first Network Computer
The IBM Network Station: low-cost, high-value e-business platform
250
Now, there's a faster way to move your business to the Internet, while avoiding timely and costly delays: AS/400 Advanced Series
The Web without the wait.
252
Check out an independent survey by Midrange Systems
Users LOVE AS/400!
254
258
260
262
264
What's New
Events
In the Press
Library
266
Australia | Italy | Japan | United Kingdom
268
[IBM home page | Search | Contact IBM | Help | fct | (TM)]
270
272
274
277
256
278
This web site is powered by IBM AS/400 Internet Connection
276
280

FIG. 5

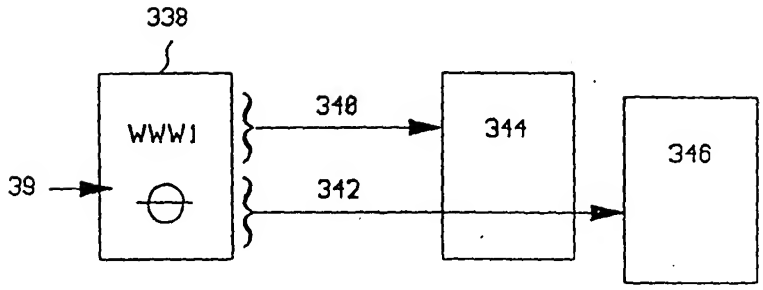

FIG. 6C

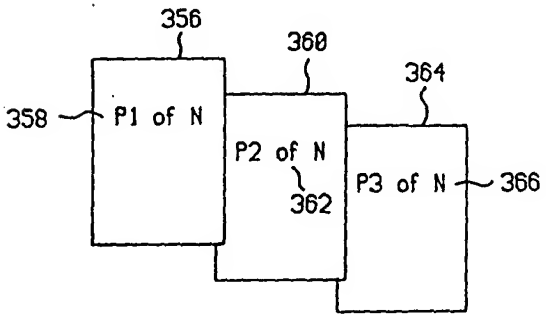

FIG. 6D

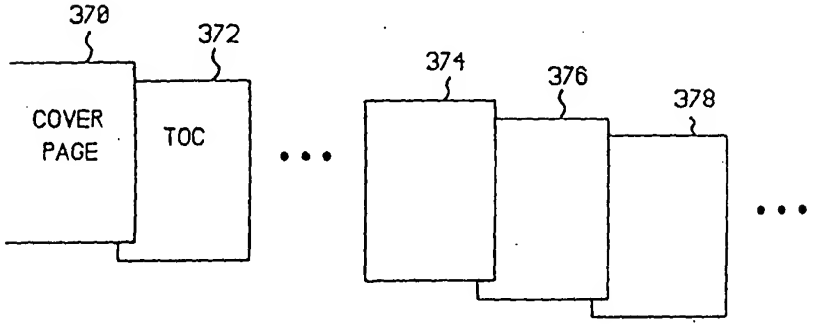

FIG. 6E

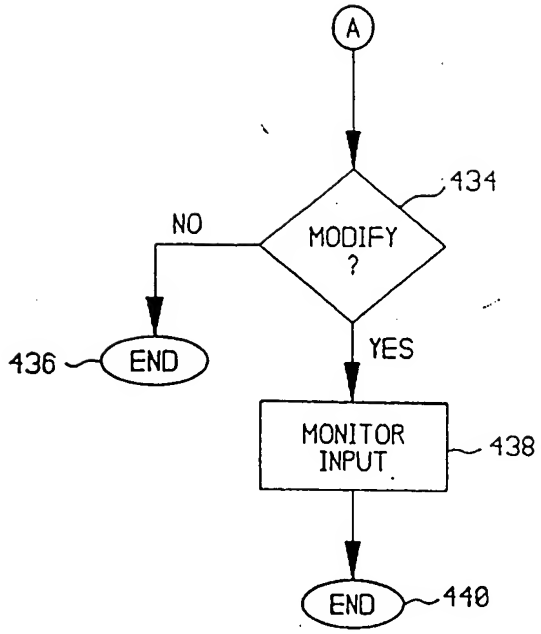

FIG. 7B

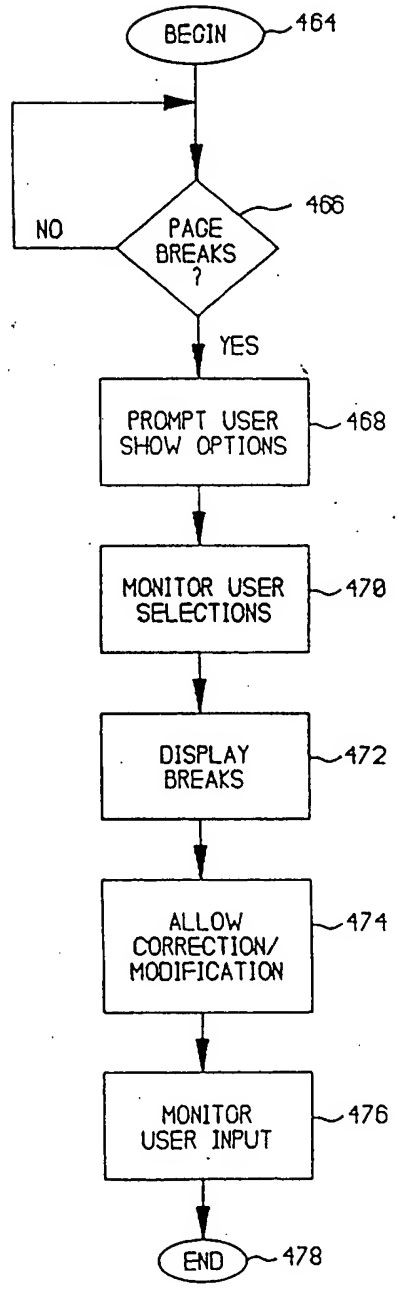
BEGIN
464
PAGE BREAKS ?
466
NO
YES
PROMPT USER SHOW OPTIONS
468
MONITOR USER SELECTIONS
470
DISPLAY BREAKS
472
ALLOW CORRECTION/ MODIFICATION
474
MONITOR USER INPUT
476
END
478

FIG. 7D